WORK INSTRUCTION

Title: MI Coating Tower Overflow Pan - Circulation System Operation
Controlling Function: Coating
Document #: W-xx-xx **Revision: 00**

1.0 PURPOSE:

This document describes the setup and operation of the MI coating tower overflow pan-formulation circulation system.

2.0 SCOPE:

This document is utilized by manufacturing associates in the coating area to set up, operate, clean, and disassemble the MI tower overflow pan-circulation system.

3.0 REFERENCES:

3.1 Intermediate Tower Startup and Shutdown Instructions W-75-61
3.2 Guidelines for an Efficient Tower Changeover W-75-140
3.3 Tower Runsheet F-71-24
3.4 Pan Change Out Log F-75-103

4.0 DEFINITIONS:

None

5.0 RESPONSIBILITIES/AUTHORITIES/INTERRELATIONSHIPS:

5.1 Process Engineering is responsible for maintaining this document.
5.2 Manufacturing Associates are responsible for carrying out the contents of this document and reporting any deviations to Process Engineering.

6.0 SAFETY:

6.1 Zone Burner Resets
- **6.1.1** The dry, bake, and fuse zones all have resets on the main panel. Maintenance must be contacted in the event a burner cannot be re-lit.

6.2 Emergency stops are located in several locations on the machine.
- **6.2.1.1** Main control Panel (1)
- **6.2.1.2** To left (north) of take-up on machine support

6.3 Make sure to wear all PPE including gloves, apron / coat, and face shield whenever handling dispersion or cleaning pan area.

6.4 All other safety procedures must be followed in the area.
- **6.4.1** Make sure to clean up all spills immediately to prevent slipping hazard
- **6.4.2** Keep hands clear of moving rolls at windup.
- **6.4.3** Keep hand clear of Peristaltic Pump during operation.
- **6.4.4** Rout all hoses and electrical cords to avoid tripping hazards.

7.0 PROCEDURE:

7.1 Overview
- **7.1.1** The MI Tower Overflow pan, Filter Pan, and Peristaltic Pump are designed to continuously circulate the formulation as the coated pass run proceeds, thereby minimizing the formation of scum, chevrons, etc. on the coated product that otherwise might occur due to dispersion settling or stagnation:

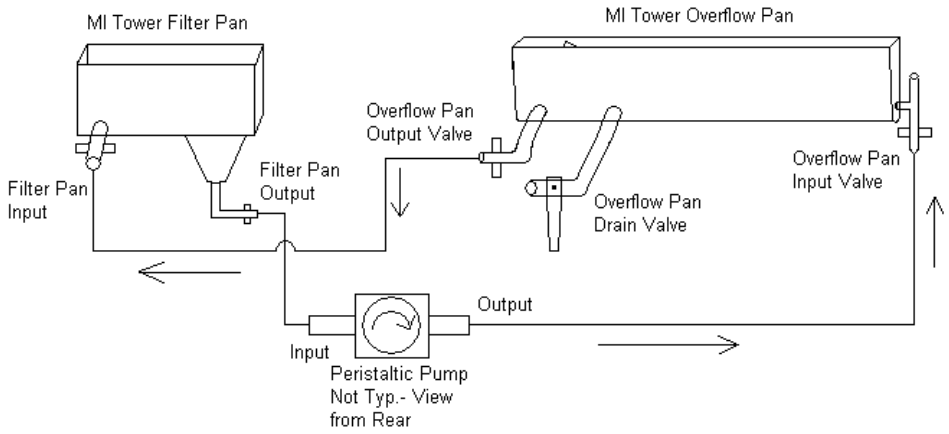


Figure 1: Overflow Pan and Filter Pan Overview; Arrows indicate circulation direction

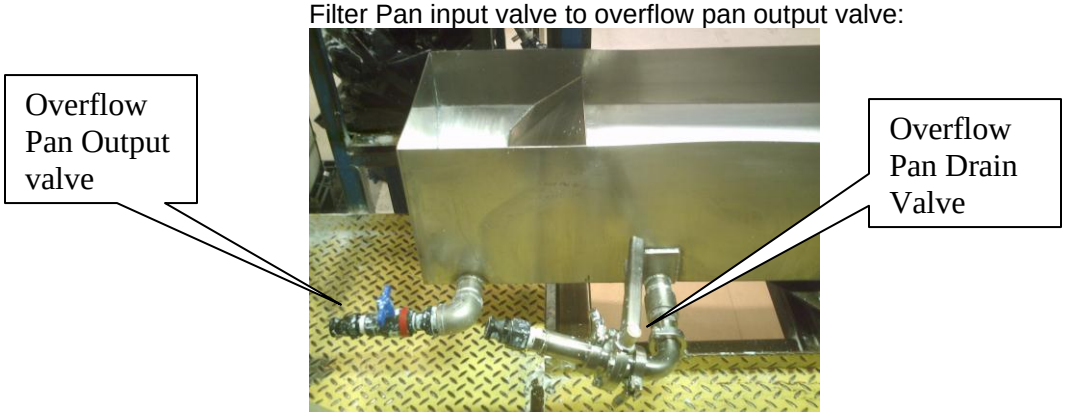
7.2 Overflow Pan Equipment Setup

7.2.1 Setup or perform tower turnaround per standard procedure (see procedure references above).

7.2.2 Place filter pan apparatus onto shelf near overflow pan:

Picture 1: Filter Pan Overview

7.2.3 Line up and connect short-length hose (coded with red tape both ends) from Filter Pan input valve to overflow pan output valve:



Picture 2: Overflow Pan Valves

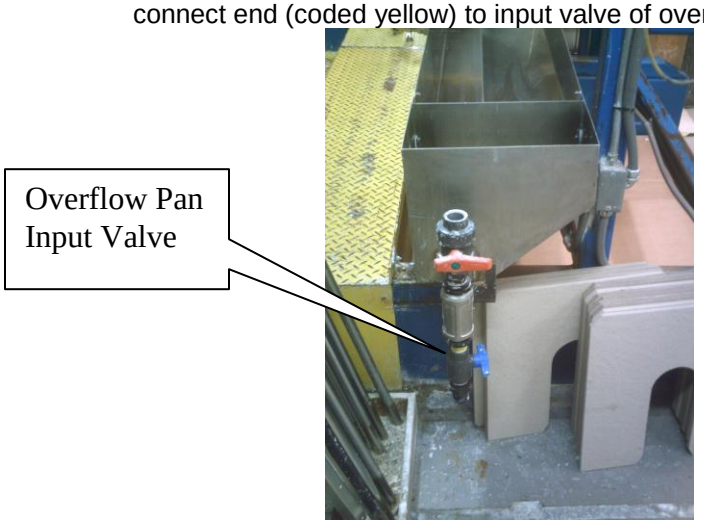
7.2.4 Install milk filter assembly into filter pan:

Picture 3: Milk Filter Assembly

7.2.5 Connect end of intermediate-length hose (coded green) to Filter Pan output; connect other end (coded yellow) to input side of Watson-Marlow Peristaltic Pump:

Picture 4: Watson-Marlow Peristaltic Pump

7.2.6 Connect end of long-length hose (end coded green) to output side of Peristaltic pump; rout hose under payoff of tower over to opposite side of overflow pan; connect end (coded yellow) to input valve of overflow pan:

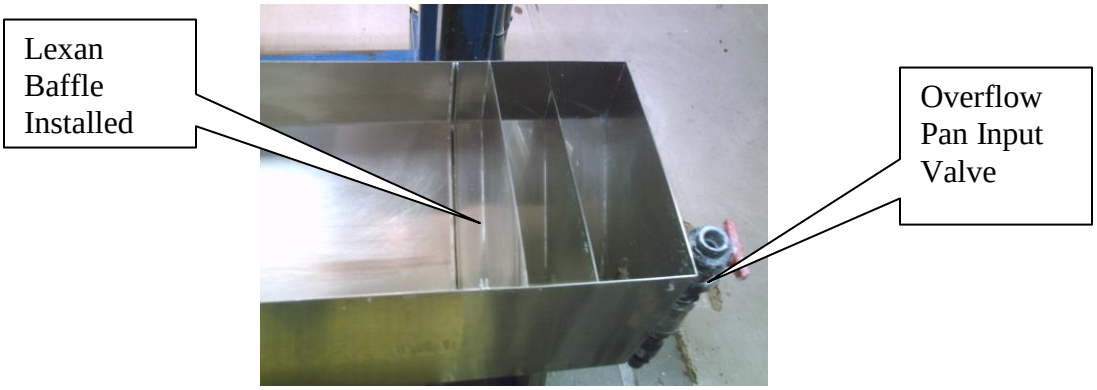


Picture 5: Overflow Pan Input Valve

BE SURE ALL HOSES ARE ROUTED THROUGH AREAS WHICH WILL NOT ALLOW THEM TO POSE A TRIPPING HAZARD.

7.2.7 Turn all valves on both pans "OFF"; be sure all hoses are connected snugly. Check Peristaltic pump and be sure hose routed through pump unit has the clamps at each end secure and tight. Be sure overflow pan drain valve is "OFF".

7.2.8 Install Lexan baffle into right side of overflow pan:



Picture 6: Overflow Pan Baffles Detail

7.2.9 Fill filter pan with formulation from a tote or vat using the diaphragm pump/hoses, per standard filling procedure. Fill to within 2" of top.

7.2.10 Open valves in the following sequence: filter pan output valve including one on hose, Peristaltic pump input hose valve, Peristaltic pump output hose valve, and 2 lower valves on/near overflow pan input valve including one on hose. **Caution:** Do not open orange upper valve on overflow pan input valve assembly; to do so will cause a spill of formulation. Also at this time leave the overflow pan output valves (including on hose end) and filter pan input valve(s) closed.

7.2.11 Plug in Peristaltic pump to an electrical outlet – rout its cable to avoid a tripping hazard. Turn rocker switch at rear of pump on; press start button at front of pump.

7.2.12 Turn up pump to 10 RPM; dispersion should then flow down hose from filter pan and enter pump, then overflow pan. Slowly turn pump up to 20 RPM and check filling in overflow pan; then turn up to 30 RPM. Replenish dispersion supply in filter pan as it drains. Formulation should now be filling or overtopping the first baffle reservoir in overflow pan.

7.2.13 If using new or freshly filtered formulation only, the filter pan input valve(s) and overflow pan output valve(s) may now be opened for faster overflow pan filling. (If using older formulation then it is best to keep filling by using the Peristaltic pump – that way the dispersion will be filtered properly as it exits the lower funnel section.)

7.2.14 When overflow pan is within 3" to 4" of top, the pan may be raised and the coating run may be started per standard tower operation procedures. Continue to add formulation to the filter pan as necessary during the run to maintain it within 2" to 3" of top.

7.3 Overflow Pan Equipment Operation and Process Maintenance

7.3.1 During the coating run, if Peristaltic pump is not pumping efficiently, not at all, or it flow is reversed, then the pump hose needs maintenance – see instructions on pump. Turn off pump both at the front red stop button and the rear rocker switch. Remove center black cover (remove black-capped bolt at left) and then remove either the left or right clamp. At this time inspect hose for any abraded or worn areas all around it. **Caution**: If hose is leaking or has worn areas that indicate it is about to leak, it must be replaced – contact engineering or maintenance dept.

7.3.2 To close up pump, stretch hose taut with one hand and replace the clamp with the other. Replace center black cover and bolt – it may be necessary to press down very hard on cover to get proper alignment for bolt insertion – **use caution and seek assistance if top cannot be secured**. Turn on pump switches and check operation.

7.3.3 Maintain proper levels of dispersion in both pans during coating runs – within 2" to top of filter pan and within 3" to 4" to top of overflow pan.

7.4 Cleaning and Dissassembly of Filter Pan, Overflow Pan and Pump – Formulation Changeover

7.4.1 Right before dropping the pan at the end of a coating run (and before pumping out) turn off Peristaltic pump on the front switch.

7.4.2 Close the input filter pan and overflow pan output valves (red coded hose).

7.4.3 Close the overflow pan input valve (yellow coded hose); also turn off hose valve.

7.4.4 Drop pan at end of coating run cleanup dip roller, meter bars, and other items per standard procedure. Stop tower when leader reaches rewind station, per standard procedures.

7.4.5 Disconnect (long hose) end from overflow pan input valve; remove hose end from routing under tower and place into tote or vat where formulation dumpback will occur. Secure hose end to tote or vat with a clamp.

7.4.6 Turn on Peristaltic pump to empty out filter pan and all connected hoses. Turn pump up to 40 RPM to speed dispersion removal as necessary from filter pan and hoses. Alternately pick up and lower long hose to aid in fluid removal into tote or vat.

7.4.7 When filter pan is nearly empty, close overflow pan output valve(s) (including one on hose), disconnect short hose (red coded) from it and drain fluid into an empty bucket. Leave other end of short hose connected to filter pan. Stop Peristaltic pump.

7.4.8 Attach male-to-male adapter to end of short hose.

7.4.9 Remove filter screens and filter paper from filter pan; discard paper. Store screens in a bucket or nearby for cleaning later.

7.4.10 Empty remaining formulation in long hose (one end in tote, yellow coded) into a bucket. Connect end of that hose to end of short hose (red coded) with male-to-male adapter installed on it.

7.4.11 Immediately fill filter pan half full with clean water and open all valves in the filter pan "closed loop". Turn on Peristaltic pump, at 40 RPM to begin flushing the system with the water. **Caution: It is critical that the clean water filling/ pumping operation be started within 2 minutes of draining out the filter pan, to avoid coating or clogging any valves or hoses with PTFE or other material.**

7.4.12 Circulate the cleaning water for 10 minutes minimum; then turn off Peristaltic pump at both the front switch and rear rocker switch and unplug it from electrical outlet. Coil up electrical cord to store properly near pump.

7.4.13 Turn off all valves at both the hoses and valve locations; disconnect each hose one end at a time and drain into a bucket. Discard water into sink.

7.4.14 Clean residual material in overflow pan using Wyp-all cloth; wipe clean.

7.4.15 Drain formulation from tower overflow pan into a clean bucket; drain bucket into the dumpback tote or vat. Repeat until all formulation had been drained from the overflow pan per standard draining procedure.

7.4.16 Clean overflow pan per standard cleaning procedures using a stainless steel scrubby and water; clean each chamber or baffle section and be sure to open each of the three valves on the overflow pan to permit the cleaning water to drain and flush the valve.

7.4.17 Remove coated roll and perform tower turnaround or shutdown per standard tower operation procedure.

Revision	Process Owner	Initials	Description of Change	Date	Approved By:	Initials
00	John McIntire		Initial Release	10/18/07		